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Search Request Form

131
99582

C

Today's Date: 7.24.03

What date would you like to use to limit the search?
Priority Date: ~~5.1.2002~~ 6.12.98 Other:

Name Justin King

AU 2181 Examiner # 79227

Room # 2A08 Phone 305-0571

Serial # 09/485443

Format for Search Results (Circle One):
PAPER DISK EMAIL

Where have you searched so far?
USP DWPI EPO JPO ACM IBM TDB
IEEE INSPEC SPI Other

Is this a "Fast & Focused" Search Request? (Circle One) YES NO
A "Fast & Focused" Search is completed in 2-3 hours (maximum). The search must be on a very specific topic and meet certain criteria. The criteria are posted in EIC2100 and on the EIC2100 NPL Web Page at http://ptoweb/patents/stic/stic-tc2100.htm.

What is the topic, novelty, motivation, utility, or other specific details defining the desired focus of this search? Pleas include the concepts, synonyms, keywords, acronyms, definitions, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract, background, brief summary, pertinent claims and any citations of relevant art you have found.

1. tree balance: position the node with higher number of ports at the top.

2. other possible term: routing => node with more ports will have higher priority.

node with higher speed will have higher priority

STIC Searcher David Holloway Phone 308-7794
Date picked up 7-24-03 Date Completed 7-24-03

Search and Information Resources Administration

DIALOG 160
982."

STIC Search Report
EIC 2100

USPTO

STIC Database Tracking Number: 99582

TO: Justin King
Location: 2A08
Art Unit : 2181
Thursday, July 24, 2003

Case Serial Number: 09/485443

From: David Holloway
Location: EIC 2100
PK2-4B30
Phone: 308-7794

david.holloway@uspto.gov

Search Notes

Dear Examiner King,

Attached please find your search results for above-referenced case.
Please contact me if you have any questions or would like a re-focused search.

David

```
Set     Items   Description
S1    8313640   TREE? ? OR DIRECTOR?  OR BRANCH?
S2    5141630   TOPOLOG? OR OPTIMI? OR ROUT? OR LAYOUT? OR ARRANGEMENT? OR
             ARCHITECTUR?
S3    8433641   BALANC? OR ALLOCAT? OR REALLOCAT? OR ASSIGN? OR REASSIGN? -
             OR MODIF? OR BANDWIDTH? OR PRIORIT? OR SPEED? OR TRAFFIC?
S4     212237   NODE?
S5     131777    (NUMBER? OR AMOUNT? OR QUANTIT? OR MOST? OR LEAST? OR FEWE-
             ST?)(2N)(LINK? OR BRANCH? OR PORT? ? OR CONNECTION? OR OUTPUT-
             ?)
S6         55   S1(S)S2(S)S3(S)S4(S)S5
S7         45   RD (unique items)
S8         27   S7 NOT PY>1998
S9         26   S8 NOT PD=19980612:20010612
S10        26   S9 NOT PD=20010612:20030901
S11        14   S1(5N)(S2 OR S3)(5N)S5(S)(BUS? ? OR SERIALBUS? OR 1394)
S12        40   S10 OR S11
S13        33   RD (unique items)
S14        27   S13 NOT PY>1998
S15        27   S14 NOT PD=19980612:20010612
S16        27   S15 NOT PD=20010612:20030901
File 275:Gale Group Computer DB(TM) 1983-2003/Jul 24
         (c) 2003 The Gale Group
File  47:Gale Group Magazine DB(TM) 1959-2003/Jul 16
         (c) 2003 The Gale group
File 636:Gale Group Newsletter DB(TM) 1987-2003/Jul 24
         (c) 2003 The Gale Group
File  16:Gale Group PROMT(R) 1990-2003/Jul 24
         (c) 2003 The Gale Group
File 624:McGraw-Hill Publications 1985-2003/Jul 23
         (c) 2003 McGraw-Hill Co. Inc
File 484:Periodical Abs Plustext 1986-2003/Jul W3
         (c) 2003 ProQuest
File 813:PR Newswire 1987-1999/Apr 30
         (c) 1999 PR Newswire Association Inc
File 696:DIALOG Telecom. Newsletters 1995-2003/Jul 23
         (c) 2003 The Dialog Corp.
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Jul 24
         (c) 2003 The Gale Group
File 674:Computer News Fulltext 1989-2003/Jul W3
         (c) 2003 IDG Communications
File 369:New Scientist 1994-2003/Jul W2
         (c) 2003 Reed Business Information Ltd.
File 160:Gale Group PROMT(R) 1972-1989
         (c) 1999 The Gale Group
File 635:Business Dateline(R) 1985-2003/Jul 24
         (c) 2003 ProQuest Info&Learning
File  15:ABI/Inform(R) 1971-2003/Jul 24
         (c) 2003 ProQuest Info&Learning
File   9:Business & Industry(R) Jul/1994-2003/Jul 23
         (c) 2003 Resp. DB Svcs.
File  13:BAMP 2003/Jul W2
         (c) 2003 Resp. DB Svcs.
File 810:Business Wire 1986-1999/Feb 28
         (c) 1999 Business Wire
File 647:CMP  Computer Fulltext 1988-2003/Jun W5
         (c) 2003 CMP Media, LLC
File 148:Gale Group Trade & Industry DB 1976-2003/Jul 24
         (c)2003 The Gale Group
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16/3,K/13 (Item 2 from file: 674)
DIALOG(R)File 674:Computer News Fulltext
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047811
LAN access worlds CONVERGE
Buyer's Guide
Once-competeing vendor camps are now borrowing from each other as business and Internet communities find common ground.
Byline: Tony Croes
Journal: Network World Page Number: 57
Publication Date: October 30, 1995
Word Count: 2153 Line Count: 201

Text:
... have rapidly adopted the Internet-based SLIP and PPP over proprietary technology as their remote **node** protocols of choice. At the same time, vendors whose roots are in the Internet community...

... third-party vendors without allegiance to either camp are producing software that will tie remote **nodes** to a mix of different vendors' LAN access servers. What this means is that the...

... Products in this market come in three different flavors: hardware, software and dial-up bridge/ **routers** . The hardware products in-clude everything from large chassis-based or modular units to fixed...

... asynchronous ports. Software-based products from Novell, Inc., Cylink Corp. and IBM support a similar **number** of **ports** when running on the right server hardware and using the LAN and WAN interfaces installed...

... Lower end workgroup products and network modems from a variety of vendors support a fixed **numbers** of **ports** , often topping out at eight. The type of product you evaluate depends on whether you want each port on the central access device to support a single **node** at a time or multiple remote **nodes** simultaneously. Alternatively, you might prefer to have a dial-up **router** connect to a central-site LAN on an as-needed basis. The choice depends on...

... channel service unit , a T-1 multiplexer and 24 V.34 modems. Incoming calls are **routed** to the T-1 line, from where the product passes them to individual mo-dems...

... in analog mo-dems to answer that call. If your remote users are telecommuters or **branch** office workers, the best solution might be to connect them to a LAN, then interconnect that LAN to a central site via a dial-up **router** . If a remote user launches an application such as a file transfer using the File Transfer Protocol or a telnet session to a host, the **router** automatically sets up a call to the appropriate network and tears it down when it's no longer needed. This is a fairly standard feature in **routers** . Most of these dial-up **routers** employ sophisticated spoofing and filtering techniques to limit unnecessary **traffic** and maintain the appearance of a link even when it is not there. Some **routers** even enable network managers to control the settings for session spoofing, which helps make sure the **router** does not maintain LAN connections once remote users finish their work. Remote security Knowing there...provided in a number of ways, including the use of add-on security hardware, restricted **node** addresses, caller identification and dialback. The add-on hardware-based security devices provide either a...

...can masquerade as an authorized user. The simplest authentication method used in PPP-based remote **nodes** is the Password Authentication Protocol (PAP), which requires the remote **node** to send an unencoded user ID and password. The remote LAN access device validates those...

... on via centralized security servers. In some cases, the security server utilizes an existing NOS **directory** such as Novell's NetWare **Directory**

Services (NDS) in NetWare 4.X or the bindery **directory** in NetWare 3.X. Novell's NetWare Connect 2.0 uses NDS authentication to control...
... To use RADIUS, a remote access server must function as a RADIUS client. When remote **nodes** request access to central-site resources, the client is responsible for communicating with the security...

16/3,K/15 (Item 4 from file: 674)
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046400
Cisco upgrades router software and hardware
Internetworking
Byline: Jim Duffy
Journal: Network World Page Number: 8
Publication Date: August 28, 1995
Word Count: 678 Line Count: 65

Text:
... to switched infrastructures, Cisco Systems, Inc. last week announced software and hardware enhancements to its **routers** to secure their place in enterprise networks. On the software side, Cisco unveiled extensions to its Internetwork Operating System (IOS) that allow users to customize **routing** , **optimize** WAN links and enhance security. On the hardware side, Cisco rolled out the high-end 7500 line, which is aimed at Bay Networks, Inc.'s Backbone Concentrator **Node** and features increased performance and port density over the company's previous top-of-the-line devices (NW Jan. 9, page 1). Version 11.0 of Cisco's IOS **routing** software now features policy-based **routing** , which enables users to establish parameters for directing **traffic** flows out particular interfaces. For example, users might want to restrict File Transfer Protocol data...
... new feature also will let users set bits in an IP packet with policy-based **routing** to implement class-of-service requirements, enabling the packet to bypass the **router** 's queues and head directly to the port. Cisco may be unique in offering policy-based **routing** , analysts said. ``You can **route** sensitive flows over internal leased lines and use the most cost-effective network technology for the level of urgency or security you have,'' said John Coons, **director** and principal analyst for wide-area networking at Dataquest, Inc. in San Jose, Calif. ``I...

... that yet.'' Cisco also has added to IOS new ``set'' commands that let users establish **routing** policies when configuring their **routers** . For WAN **optimization** with IOS, Cisco has added NetWare SPX spoofing, AppleTalk Name Binding Protocol (NBP) filters and floating static **routes** for AppleTalk and VINES **traffic** . SPX spoofing enables **routers** to locally acknowledge NetWare ``keep alive'' packets so this **traffic** does not congest WAN links. The AppleTalk NBP filters get rid of unwanted NBP **traffic** , which can chew up a lot of **bandwidth** during broadcasts. By filtering unwanted NBP **traffic** , IOS 11.0 enables users to better utilize network **traffic** and improve security by hiding AppleTalk devices, Cisco said. The enhanced floating static **route** capability, which Cisco already supports for IP and IPX data, allows users to define in the **routing** tables a default dial-up path to be used as a last resort when a leased-line fails. Lastly, for better security, Cisco has added **route** authentication and IP access list violation logging to IOS. **Route** authentication requires Cisco **routers** to provide an encrypted signature when sending **routing** table updates to other **routers** . This can help thwart spoofing, eavesdropping and intrusion. IP access list violation logging helps users...

...scanning host log files. The logging feature of IOS 11.0 records source, destination and **port numbers** of all incoming packets, the protocol type and any action taken to permit or deny access of **traffic** at the network perimeter. It then generates access list updates during regular time intervals so...

... Cisco IOS 11.0 will be available in September. Hardware highlights Cisco's new 7500 **router** line features a series of enhancements on the hardware side that include integrated **route** /switch processors, interface cards that perform local **route** processing and a backplane that is scalable from 1G to 2.1G bit/sec. The interface cards, called Versatile Interface Processors, perform frame forwarding and local **routing** to ports on the same interface. **Routing** between interfaces is done by the **route** /switch processors. The previous high-end offering, the 7000 line, had

separate **routing** and switching processors, lacked local **route** processing on the interface cards and had a backplane that topped out at 533M bit/sec. ``The **architecture** of (the 7500) is designed for greater reliability and availability,'' said Vince Fuller, senior network architect for BBN Planet Corp. ``It has greater capabilities for doing more complex **routing** calculations than the 7000 does.'' Cisco: (408) 526-4000.

16/3,K/16 (Item 5 from file: 674)
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045612
Switch traffic, not speeds
Buyers Guide
This lineup of LAN switches can boost net throughput as an interim step on the road to ATM.
Byline: Michael Marburgh and Brian Ten Eyck
Journal: Network World Page Number: 55
Publication Date: July 17, 1995
Word Count: 2878 Line Count: 277

Text:
... throughput is akin to improving existing rail service while planning a new infrastructure for high- **speed** bullet trains. You can establish some express services between local points or lay new track on older **routes** so trains can go a tad faster. As you do this, you don't want...

... be more tactical than strategic as users and vendors alike see Asynchronous Transfer Mode technology **speeding** down the track. Still, the LAN switching market is one of the most exciting segments...

... means for postponing wholesale infrastructure upgrades. Some LAN switches now support 100M bit/sec LAN **speeds** , including 100Base-T, 100VG-AnyLAN and Fiber Distributed Data Interface networks. Market appraisal As you...

...that enable you to call anyone from anywhere, although sometimes you may need to use **directory** assistance to look up a number. These high-end calling plans are akin to backbone...

... enterprise. Following is a conceptual breakdown of each switch type: Desktop switches provide users of **bandwidth** -intensive, performance-hungry applications such as modeling, imaging and visualization with a dedicated LAN segment. Each PC connected to a desktop switch can communicate at the full LAN **speed** . The switch can also have a link or two to a server or backbone, essentially...

... way into engineering firms, research and development organizations, and small enterprises that need to dedicate **bandwidth** to each PC. Desktop LAN switches in-clude Amber Wave Systems, Inc.'s AmberSwitch, Fore...

...chain. They address the need to improve performance between LAN segments and provide a high- **speed** , cost-effective way to further segment LANs. The alternative is to burn up **router** ports, which can be three to 10 times more costly. Workgroup switches are connected to...

... to provide segment connectivity, with a maximum of four ports typically capable of providing high- **speed** connections to servers or a collapsed backbone. By supporting multilayer intelligence, workgroup switch-es can...

... have more address memory than their desktop siblings. The network layer information is used for **traffic** filtering to ensure broadcast containment and security. These mid-range products have rudimentary Remote Monitoring ...through a hub module. The backbone switch can have additional feeds to a wide-area **router** and to campus user groups via a hub, workgroup switch or desktop switch. Backbone products are multilayer switches that filter and pass **traffic** based on data link layer or net layer information. Eventually, backbone switches will dynamically decide whether to **route** or switch incoming packets based on previous **traffic** patterns, but they currently use a simplified protocol-based ap-proach. Backbone switches are more...

... are based on a chassis design that supports hot-swappable modules, multiple network types, high- **speed** backplanes and greater port density. In addition, the big switches have more sophisticated management. For...

... as their Ethernet brethren due to their more immature market and their role in net **architectures** . In token-ring environments, switches are used to replace bridges, augment **routers** and switch **traffic** among server farms, roughly correlating to workgroup and backbone switching. Token-ring ports on products...

... modules, analogous to an intelligent wiring hub chassis. A stand-alone unit supports a fixed **number** of **ports** and is generally used as a desktop switch. The main differentiators among products here include increased management functions and the switch's ability to implement high- **speed** port alternatives. Stackable switches are essentially stand-alones that can be linked together and managed...

... packets on incoming ports and switches them to outgoing ports, these products have a few **architectural** differences. The first is how the switch switches, also known as its forwarding method. There are essentially two options, depending on your need for **speed** and tolerance for packet loss. The first, cut-through forwarding, was pioneered by Kalpana. It...

... The forwarding method a switch uses varies greatly based on whether it has bridging or **routing** software. But most switches use some variation of the store-and-forward method. The disadvantage...
... proprietary forwarding methods that combine techniques from cut-through and store and forward. Sometimes called **modified** cut-through, these methods vary by vendor but generally add some store-and-forward capabilities...

... frames until they receive a token. They must also have buffer input for multiple interface **speeds** , such as 4M, 16M and 100M bit/sec. Consequently, use of cut-through mode is relegated to dedicated segments and connecting like- **speed** rings, while store and forward is more suitable for diverse networks and the con- servative nature of most token-ring environments. There is also the issue of source **route** bridging (SRB) vs. transparent bridging in token-ring environments. SRB is essentially a token-ring...

... maximum of seven bridges, or hops. When the explorer frame returns to the source, the **route** it took is included in every packet sent to that destination in the future. SRB is found in mosttraditional token-ring Systems Network **Architecture** or NETBIOS networks. As these nets grow, however, SRB's added latency and hop count become hindrances. Transparent bridging enables a switch to bypass the **route** discovery process inherent to SRB and forward packets based on MAC addresses, just as it...
... Systems, Inc., Cabletron and Bay Networks' Centillion, employ a hybrid bridging method, known as source **routing** transparent. This approach essentially translates SRB into transparent bridging by eliminating the SRB header information within a packet and treating the **route** to that point like one large **node** . The advantage to this method is that it allows the switch to exceed the hop...

... one agent for the entire box and polling each port, as 3Com does, or sending **traffic** statistics between any two ports to a dedicated monitor port, the way Bay Networks' Centillion...

... mass-market success of switch-based VLANs. A VLAN is a broadcast domain enabling any **node** or resource to reside on the same logical LAN segment, regardless of location. The level...

...it will be necessary to use a tool that will automate user configuration and resource **allocation** . Rather than constantly moving resources between VLANs in reaction to dynamic **traffic** patterns, youll need to define policies and constraints in a tool to assist in automatically...

... are deployed. Of course, to efficiently manage broadcasts within a bridge group, the number of **nodes** must remain below a few hundred. Server consolidation, end-user comfort levels in navigating across networks, corporate applications and flattening organizational structures are making communities of interest larger and associated **traffic** patterns harder to

define. This means that **traffic** will become increasingly dynamic and global, limiting the VLANs' ability to significantly improve performance or ...

...as users react to congestion concerns. Longer term, networks will evolve from todays shared-media **architecture** to an enterprise switched infrastructure with an ATM backbone at its core. ATM will become a viable high- **speed** option for certain areas of the network as price points continue to fall, moving it...

... gain momentum down to the desktop until 1998 or 1999, when drivers for such high **bandwidth** begin appearing, standards solidify and price points become competitive with other fast LAN alternatives. Moreover...

16/3,K/17 (Item 6 from file: 674)
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044445
Tools for the network handyman
NetworkWorld Review, NetoworkWorld TEST ALLIANCE, RFC
While not all components are best of class, these LAN management products offer lots of tools in a single package.
Byline: Kristin Marks
Journal: Network World Page Number: 63
Publication Date: May 22, 1995
Word Count: 4829 Line Count: 435

Text:
...substantial network resources to run. LANDesk Manager is fully aware of NetWare 4.1 NetWare **Directory** Services (NDS). Users can manage NDS objects and containers directly and not just in bindery...

... program and the LAN-Desk applications. Because LAN-Desk Manager is licensed on a per- **node** basis, multiple servers count as additional **nodes** , which simplifies pricing for large organizations with many servers. Administrators also need a system dedicated...

... relays information back to the server NetWare Loadable Modules (NLM), which then can graph network **traffic** in a variety of ways on a manager's console. Probes have to be at...There is an IntroPack bundle that includes NetWare Management, NetWare Early Warning System and LAN **Directory** for server management, alerts and inventory, respectively. It doesn't, however, include distribution or metering...

...are hidden, you have to select a dataset file name from a file list. The **architecture** of the product allows datasets to be stored on multiple servers and then consolidated by the console for enterprise management. This keeps unnecessary network **traffic** down while providing flexibility. On the other hand, this flexibility leads to complexity and serious...

... both workstations and file servers once you find it, it can't show you the **directory** location or file name of the identified software. For example, we ran an inventory query...

... out where they were located, technical support suggested I access a DOS shell and run **directory** commands. That exercise revealed that LANDesk only looked on the SYS volume and, therefore, missed...

... TEST volume. This is a serious flaw. If I wanted to run a software distribution **routine** that deleted all the older versions of a common program to recover valuable server disk space and then copy the newest version to the PUBLIC **directory** , I wouldn't be able to write the script without going to the command line...

...a script. One inventory feature unique to LANDesk is hot identification. You can select a **node** and ask Desktop Manager to determine its inventory

immediately as ... You can access data by machine or query for a set of components across all **nodes** . Every screen is printable or can be seen in formal reports (see Figure 4). NAN...

...of the bunch, but Fryes ran a close second. If Frye's inventory program, LAN **Directory** , were a knife, it would be the beat-up one always in your pocket that...

... it for accuracy and comprehensive identification, but the query process needs to be simplified. LAN **Directory** has separate hardware and software databases, so performing queries that involve all personal computers of...

... not as accurate as the other products we looked at. Little things such as the **number** of LPT **ports** a station has and the names of most of the software are incorrect or skipped...
... This means there's no extraneous stuff in the INI files or Windows or System **directories** . LANDesk Manager takes a snapshot of this clean Windows configuration and copies it to the...like NET.CFG or AUTOEXEC.BAT, you have to create the snapshot of your Windows **directory** , which is irrelevant to the process. You can't just instruct the program to add...

... control. Both NAN's NEF and SUDS' Wide Area Network Distribution module can establish distribution **routes** across multiple servers with minimal impact on the WAN links **traffic** . Both are good full-featured applications, with NEF being easier to use. LAN-Desk Manager considers servers just another type of **node** ; as long as the target server is in the management domain you set up, you...

...and Resource Tracking, you select which executables you want to meter by selecting from a **directory** listing; in NAN, you select from the master software list. You must name the application to be metered. If you select WORD. EXE from the \APPS\ WORD **directory** , you still have to tell Frye Metering and Resource Tracking and LANDesk Manager that it...set up a condition so that when a supervisor user logs on from a certain **node** address, the program sends you an E-mail message and clears the connection to the disallowed **node** . It takes longer to set this up in LANDesk Manager than in the Frye products...
... and products such as DiskLock can help. Besides scripting, LANDesk Manager and FUN both include **node** analysis tools for conducting point-to-point testing of network communications and packet statistic monitoring...

...also includes a subset of Intel's Vprotect virus protection program. You can select a **node** and perform a virus check on demand. This is not a complete virus protection program...

... help desk package that's simple to use and a great tool for keeping troubleshooting **priorities** straight. We'll review help desk packages in a future issue. You should be able...

... But be careful: NetTune creates some hefty-size files in the server's SYS:SYSTEM **directory** to track all the graphics. In addition, NetTune can issue NetWare SET commands and makes recommendations on how best to **optimize** server performance in critical areas such as **balancing** memory pools. Charts, in real time and short-term history, are available for memory pool **allocation** , connection information, disk activity, LAN packets and several other statistics. Best of all, the charts can be printed. All the Brightworks modules can print beautiful reports. Many report **layouts** are provided so you don't have to spend your days lining up columns. Saber...

... limited value. For example, Disk Mapper is a utility for linking drive letters to network **directories** , a function better handled with the NetWare User utilities that come with the Virtual Loadable...

...the main modules. Saber's Server Manager tracks the same SET parameters, server statistics and **optimization** suggestions as Brightworks' NetTune but without the charts. The module also suffers from the same...

16/3,K/20 (Item 9 from file: 674)
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042312
Beware of frame relay gotchas
Feature
So you're ready to make the jump to frame relay? Well, you might want to consider the common pitfalls and how best to avoid them.
Byline: Christine Heckart
Journal: Network World Page Number: 36
Publication Date: February 06, 1995
Word Count: 3646 Line Count: 330

Text:
...protocol choices, may have far-reaching effects on network performance. And for users supporting different **traffic** types, such as LAN and Systems Network **Architecture** data, you need to be prepared for the consequences of which integration method you choose...

... issue you should be prepared to deal with is the so-called split horizon. Since **routers** in a leased-line environment have one physical port associated with each leased line, vendors...

... split horizon prevents data from bouncing back and forth across the network in a big **routing** loop when a link between two sites fails. Enabling split horizon makes perfect sense in...

... different PVC - such as a Data Link Connection Identifier (DLCI). Yet the possible creation of **routing** loops must still be avoided. For users that plan to employ a public frame relay service with a partial mesh of PVCs and want optimal **routing** , the solution is a virtual WAN connection. The **router** vendors developed the concept of virtual WAN connections to allow **routers** to treat each DLCI as though it were a leased line, recognizing each independently. **Routers** supporting this capability will send a frame back through the same physical port over which...

... to be sent back through the same PVC/DLCI over which it was received. PROTOCOL **PRIORITIZATION** If you think keeping an eye out for a split horizon is a problem, consider that you also need to pay close attention to **traffic** **priorities** . One of the major benefits of frame relay is its ability to handle multiprotocol environments...

... important than others. New users of frame relay may not realize that they need to **prioritize** their wide-area applications to **optimize** network price and performance. Most **router** vendors today support one or more alternatives for **prioritization** of **traffic** . Keep in mind that the **router** has a serial interface into the WAN. This means multiple frames are not transmitted simultaneously but are transmitted in a serial fashion at the **speed** of the port connection. Therefore, mission-critical transactions that require rapid response times should be **prioritized** above other **traffic** -like LAN file transfers that are not mission-critical and are not as sensitive to response time. There are several ways to **prioritize** **traffic** . One method is **priority** queuing. Depending on the **router** vendor, differing **priority** levels may be **assigned** by a combination of protocol choice, TCP/IP **port** **number** and packet size. The number of **priority** levels varies somewhat by vendor. For example, Bay Networks, Inc. (formerly Wellfleet) **routers** offer high-, medium- and low- **priority** queues, and Cisco Systems, Inc. offers high-, medium-, normal- and low- **priority** options. In the case of these vendors, the buffers associated with each queue are user-configurable. The high- **priority** queue might have a buffer of 20 packets; the medium, 40 packets; the normal, 60 packets; and the lowest, 80 packets. **Routers** will empty the waiting packets in the high- **priority** queue before moving on to the next queue and then empty it, and so on. The only way a lower **priority** packet would be sent is if there is no other higher **priority** **traffic** in the queue. A slightly more sophisticated implementation allows you to set up a minimum level of output for each queue so low- **priority** queues

are sampled even when the higher **priority** queues are continually full. This may prevent low- **priority** applications to keep from timing out. When implementing this type of **prioritization** , you should be sensitive to how the higher level application protocols will respond if acknowledgement delays are incurred. Also, you would be wise to consider the average and peak **traffic** loads for each **priority** queue. If the buffers overflow, packets will be discarded and retransmission will need to occur...

...to-end session management algorithm may resend the data, contributing to congestion. In addition to **priority** queues, the discard eligibility bit can be controlled by the user, providing another mechanism for **prioritizing** **traffic** . The Discard Eligible (DE) bit is a binary bit that resides in the packet header...

... frame to be discarded. Setting the DE bit would typically be done in conjunction with **priority** queuing. Many **routers** allow the DE bit to be set to indicate discard eligibility if that packet is within a low- **priority** queue or in any queue but the high- **priority** queue. The reason for doing this is that when the **router** has a lot of data to transmit to the frame relay network, the high- **priority** **traffic** will be counted toward the committed information rate (CIR) level, while the lower **priority** **traffic** will already have the DE bit set when it arrives at the frame relay switch. The switch will treat DE-marked packets as burst **traffic** , increasing the probability that all the high- **priority** **traffic** will be sent through the net as nondiscard-eligible. The result is that the high- **priority** **traffic** has a greater likelihood of getting through the network without being discarded, even during peak **traffic** periods, since it is more likely to be within the CIR. **Prioritization** can be used alone or with logically separate PVCs as a mechanism to ensure that mission-critical **traffic** is delivered across the net in a timely and reliable manner. One of the biggest keys in implementing **prioritization** is knowing the relative **priority** of different applications, protocols and users. For example, some of the transaction **traffic** could be SNA data delivered to a token-ring LAN interface to the **router** , while other mission-critical transactions could be hiding in TCP/IP-encapsulated telnet packets. Also, **prioritization** within the **router** is only one part of the answer. The **router** interfaces with the carrier's frame relay service, which is another area of potential **traffic** congestion. This is why setting the DE bit in conjunction with using **priority** queues can be advantageous. IMPACT OF **ROUTING** PROTOCOLS Your work with protocols is by no means over. The method in which **routers** exchange status and address information can have a significant effect on network design and network performance. One purpose of exchanging this information is so the **router** can select the best available path on which to **route** individual frames for transmission. There are two ways to categorize **routing** protocols. The first category for protocols is based on the method the **router** uses to select the optimal **route** through the net. The main types of **routing** protocols are distance vector, distributed update algorithm (DUAL) and link state. The second protocol category is based on the method by which, and how often, the **routers** exchange **routing** table information. In this category are the traditional periodic and the newer update-only **routing** protocols. Distance-vector protocols, such as the **Routing** Information Protocol (RIP), use a hop count to determine the best available path. The path with the fewest number of intermediate hops is chosen. DUAL **routing** protocols are a sophisticated version of distance vector protocols, having internal metrics that allow the **router** to consider cost information, much like link-state protocols. The **most** popular **link** -state **routing** protocol is Open Shortest Path First (OSPF), which is often referred to as the successor...

... in the network, while link-state protocols keep a complete real-time picture of every **route** . Link state relates back to the amount of congestion and overhead on the net by exchanging information with the **routers** . That is, a link-state protocol creates a lot of chatter, whereas other protocols only send **routing** updates to minimize **traffic** congestion. **Routing** updates refer to how often and by what means **routers** **routinely** exchange information. Obviously, you don't want networks congested with **routing** table updates. Yet the updates provide

the most recent view of the network **topology** , including any PVCs - such as DLCIs - or local loops that might be temporarily unavailable, or...

... is a trade-off between real-time status updates and the amount of extra net **traffic** . In large nets, performance problems can result when a large number of DLCIs are supported by one or more **routers** , especially if a periodic **routing** algorithm is used. Some periodic **routing** protocols include RIP and Novell, Inc.'s Service Advertisement Protocol (SAP); SAPs announce to other network servers the services offered by the broadcasting host. When a **router** using a periodic **routing** protocol updates the other **routers** to which it is connected, it replicates its own **routing** table and transmits a copy over each DLCI. If your frame relay network has lots of DLCIs, you can expect lots of **traffic** on the local loop and lots of packets in the interface buffers. The **traffic** is of a high **priority** because network instability could result if the data is lost or damaged. A high volume of broadcasts can impact **traffic** flows. Some periodic **routing** protocols broadcast a full **route** table update every 30 or 60 seconds over each DLCI. The bytes per **routing** table entry could range from four to 16 depending on the **routing** protocol. SAPs might approximate 85 bytes per table entry. Each complete update must be sent...
... large networks this creates congestion problems. An alternative to sending a full copy of the **route** table periodically is to send only the updates, or changes, to the tables on a required basis. This update-only approach significantly reduces the amount of broadcast **traffic** on the network. OSPF, the Enhanced Interior Gateway **Routing** Protocol (EIGRP), Novell's NetWare Link Services Protocol (NLSP), the Border Gateway Protocol and Intermediate...

... that support this update-only approach. Update-only protocols send a keep-alive signal between **routers** about every 10 seconds. Changes in the **routing** information are broadcast as they occur. And every 30 minutes or so, the **router** broadcasts a full update. Some **router** vendors have implemented a special queue in the **router** with its own buffer for broadcast **traffic** such as **routing** and SAP updates. This allows the **router** to handle broadcast updates separate from user data. As a general rule of thumb, update **traffic** should be kept at 20% or less of the access link **speed** . The bigger the network and the slower the connection **speeds** , the more of animpact **routing** updates and broadcast **traffic** will have on overall net performance. Intelligent update-only protocols, such as DUAL or link...

... rates are low. THE NOVELL CURVE Novell's NetWare is the most widely implemented LAN **architecture** and network protocol, with an estimated 70% of internetworks supporting at least some IPX **traffic** . There is a long and painful story about **routing** IPX over a WAN. Whether the network consisted of private lines, X.25, frame relay...

... discrimination. It performed horribly over them all. Basically, IPX was not initially intended for low- **speed** WAN connections or the relatively long response times that these connections provide; even at the **speed** of light, there is measurable propagation delay over the fiber in traveling cross-country. IPX was designed to operate over very high- **speed** local connections. Since it was designed for the local environment, IPX required one acknowledgement packet...

...because new services are typically not added every minute to the server. In choosing a **routing** protocol for IPX, RIP may be the only available choice, depending on the **router** vendor. While this is less than ideal, the SAP filter will at least help matters. More efficient intelligent **routing** protocol choices include Cisco's EIGRP and a new **routing** protocol that Novell is working on called NLSP. This link-state algorithm will also provide support for load- **balancing** **traffic** , sorting net addresses, more intelligent selection of **routes** and update-only **route** table exchanges. INTEGRATING LAN/SNA **TRAFFIC** Novell creates some problems with its IPX protocol, but SNA users have their own set...

... facilities, and streamlines network monitoring and management. The standard approach for integrating LAN and SNA **traffic** over a frame relay

backbone has been to use a **router** that implements source **route** bridging (SRB), Data Link Switching (DLSw) or some other approach to SNA tunneling, or SDLC...

...they are TCP/IP-oriented and do not provide the same level of SNA-based **routing** or congestion control and **traffic** **prioritization** . In LAN and SNA consolidation and migration, as in many other areas, IBM does not...

...alternative - depending on the size of their nets - whether they want to maintain some subarea **traffic** or they want to truly send SNA over the internetwork. IBM now widely supports Ethernet...

... on the 3174 and 3745 controllers. The protocol for using LAN transmission media for SNA **traffic** is the LLC2 protocol. LLC2 is the SDLC equivalent for LANs. LAN-attached PCs running SNA applications can use LLC2 to send data to the mainframe. A LAN-attached **router** will either SRB, DLSw or **route** the **traffic** via Advanced Peer-to-Peer Networking or the improved APPN protocol known as High Performance **Routing** (HPR), sometimes called APPN Plus. With SRB, the LLC2 session passes transparently through the **router** and is not locally terminated. In large networks, this can cause an unacceptable level of...

... Server, is another path to consolidate LAN and SNA, and it enables SNA to be **routed** on the WAN. **Routers** that support HPR and can act as a Network **Node** with dLUR will be able to **route** the SNA **traffic** . The result, once this solution is available, will be an integrated environment that supports subarea...

... works the same whether the SNA equipment is LAN-attached or directly attached to the **router** . With DLSw, the **router** will terminate the polls locally, improving network response time and decreasing the congestion over the WAN by filtering out most of this polling **traffic** . DIAL BACKUP SNA issues aside, frame relay has proven to be a very robust technology...

...server with information on the port connection and PVC to which the call should be **routed** . Even with the new services, in most cases, users will not be able to dial...

... not automatically move aside to make room for a dial-up connection into that same **port** . At **least** one frame relay service provider, CompuServe, Inc., plans to offer a solution that will allow...

...recover from a failed local loop, although it is the most cost-effective for low- **speed** remote network locations. A dual-homing configuration can also be used. This would be the...

... locations connecting into this site need two PVCs, one to each port connection. However, the **speed** of each PVC only needs to be half of what it would be in a normal configuration. The **router** at each site will load- **balance** the **traffic** between the two loops and two PVCs, as long as both are active. If one of the dedicated loops at the primary site fails, then all **traffic** is **routed** over the active loop. Performance may be temporarily affected, but connectivity is not lost. AVOIDING...

... preplanning can save many late hours and spare you those Excedrin moments. Heckart is a **director** of broadband with TeleChoice, Inc., a Verona, N.J., consultancy specializing in broadband network services...

```
Set     Items   Description
S1      983417  TREE? ? OR DIRECTOR?  OR BRANCH?
S2     3285702  TOPOLOG? OR OPTIMI? OR ROUT? OR LAYOUT? OR ARRANGEMENT? OR
             ARCHITECTUR?
S3     4849652  BALANC? OR ALLOCAT? OR REALLOCAT? OR ASSIGN? OR REASSIGN? -
             OR MODIF? OR BANDWIDTH? OR PRIORIT? OR SPEED? OR TRAFFIC?
S4      314392  NODE?
S5       69158  (NUMBER? OR COUNT? OR QUANTIT? OR AMOUNT OR LEAST OR FEWEST
              OR MOST OR FEW OR FEWER OR GREATER OR LESSER OR TOTAL)(2N)(L-
             INK? OR PORT? ? OR CONNECTION? OR OUTPUT? OR BRANCH? OR LEAF?)
S6         144  S1 AND S2 AND S3 AND S4 AND S5
S7          92  RD (unique items)
S8          68  S7 NOT PY>1998
S9          39  S1(10N)(S2 OR S3) AND S8
S10         39  S9 NOT PD=19980612:20010612
S11         39  S10 NOT PD=20010612:20030901
S12          1  S8 AND (BUS? ? OR SERIALBUS? OR 1394)
S13         40  S11 OR S12
File   8:Ei Compendex(R) 1970-2003/Jul W2
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         (c)2003 Japan Science and Tech Corp(JST)
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         (c) 1998 Inst for Sci Info
File  34:SciSearch(R) Cited Ref Sci 1990-2003/Jul W3
         (c) 2003 Inst for Sci Info
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         (c) 2003 American Institute of Physics
File  99:Wilson Appl. Sci & Tech Abs 1983-2003/Jun
         (c) 2003 The HW Wilson Co.
File  95:TEME-Technology & Management 1989-2003/Jul W1
         (c) 2003 FIZ TECHNIK
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13/5/4 (Item 4 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
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04441813 E.I. No: EIP96073234525
Title: Congestion control with a multicast routing **algorithm**
Author: Hac, Anna; Wang, Dongmei
Corporate Source: Univ of Hawaii at Manoa, Honolulu, HI, USA
Conference Title: Proceedings of the 1996 1st Annual Conference on Emerging Technologies and Applications in Communications
Conference Location: Portland, OR, USA Conference Date: 19960507-19960510
Sponsor: ACM; IEEE
E.I. Conference No.: 44912
Source: Proceedings of the Annual Conference on Emerging Technologies and Applications in Communications, etaCOM 1996. IEEE, Piscataway, NJ, USA, 96TH100035. p 70-73
Publication Year: 1996
CODEN: 002395
Language: English
Document Type: CA; (Conference Article) Treatment: A; (Applications); T ; (Theoretical)
Journal Announcement: 9608W5
Abstract: A new multicast **routing** algorithm reducing congestion is presented in this paper. The algorithm uses efficient **routing** by transmitting multicast packets across **fewer** **links** in the network. The algorithm is **balancing** the use of network **nodes** and links by reducing packet duplication in the **nodes** . The computation time of the algorithm is short. The results show that the algorithm can find the multicast paths by using the minimum **number** of **links** and reduce congestion. (Author abstract) 9 Refs.
Descriptors: Algorithms; Congestion control (communication); Local area networks; Telecommunication links; Computational complexity; Heuristic methods; **Optimization** ; **Trees (mathematics)** ; Switches
Identifiers: Multicast **routing** algorithm; Minimum spanning **tree** algorithms; Distance vector **routing** ; Transmitting multicast packets
Classification Codes:
723.5 (Computer Applications); 716.1 (Information & Communication Theory); 721.1 (Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory); 921.6 (Numerical Methods); 921.5 (Optimization Techniques); 921.4 (Combinatorial Mathematics, Includes Graph Theory, Set Theory)
723 (Computer Software); 716 (Radar, Radio & TV Electronic Equipment); 721 (Computer Circuits & Logic Elements); 921 (Applied Mathematics)
72 (COMPUTERS & DATA PROCESSING); 71 (ELECTRONICS & COMMUNICATIONS); 92 (ENGINEERING MATHEMATICS)

13/5/5 (Item 5 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
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04399217 E.I. No: EIP96053159719
Title: Effective approach for achieving fault tolerance in hypercubes
Author: Al-Tawil, Khalid M.; Avresky, Dimiter R.
Corporate Source: Texas A&M Univ, College Station, TX, USA
Conference Title: Proceedings of the 1995 Fault-Tolerant Parallel and Distributed Systems
Conference Location: Galveston, TX, USA Conference Date: 19940613-19940614
Sponsor: IEEE
E.I. Conference No.: 44607
Source: Proceedings of the Conference on Fault-Tolerant Parallel and Distributed Systems 1995. IEEE, Piscataway, NJ, USA. p 113-120
Publication Year: 1995
CODEN: 002337
Language: English
Document Type: CA; (Conference Article) Treatment: A; (Applications); T ; (Theoretical)
Journal Announcement: 9606W5
Abstract: The hypercube network is an attractive structure for parallel processing because of its regularity. The problem of tolerating faulty processors in hypercubes has been studied by many researchers, either by using spares or by reconfiguration. In this paper, we present algorithms for achieving fault tolerance in hypercubes using spanning **trees** , without requiring additional spare **nodes** . We present two algorithms; one uses completely unbalanced spanning **trees** (CUST) and the other uses **balanced** spanning **trees** (BST). Both algorithms use, at **most** , one used **link** and one unused link for every reconstructed path in the reconfigured hypercube. The algorithms are optimal, in terms of the reconfiguration time and may increase the congestion of a **link** by, at **most** , one with no extra-dilation. Single-fault coverage of 100% and almost 100% fault coverage of double and triple faults are achieved by the proposed algorithms for hypercubes having a dimension of n greater than equivalent to 10. (Author abstract) 10 Refs.
Descriptors: Interconnection networks; Parallel processing systems; Fault tolerant computer systems; Algorithms; Failure analysis; Electric network **topology** ; Graph theory; Mathematical models
Identifiers: Fault tolerance; Hypercube network; Spanning **trees** ; Completely unbalanced spanning **tree** ; **Balanced** spanning **trees** ; Reconfiguration time; Single fault coverage
Classification Codes:
722.4 (Digital Computers & Systems); 921.6 (Numerical Methods); 921.4 (Combinatorial Mathematics, Includes Graph Theory, Set Theory)
722 (Computer Hardware); 921 (Applied Mathematics)
72 (COMPUTERS & DATA PROCESSING); 92 (ENGINEERING MATHEMATICS)

13/5/12 (Item 12 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
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03025277 E.I. Monthly No: EIM9102-007934
Title: Compressed tree **machines.**
Author: Zheng, Si-Qing
Corporate Source: Dept of Comput Sci, Louisiana State Univ, Baton Rouge, LA, USA
Conference Title: Proceedings - Ninth Annual International Phoenix Conference on Computers and Communications
Conference Location: Scottsdale, AZ, USA Conference Date: 19900321
Sponsor: IEEE; IEEE Communications Soc; IEEE Computer Soc; Arizona State Univ; Univ of Arizona
E.I. Conference No.: 13983
Source: Conference Proceedings - Annual Phoenix Conference. Publ by IEEE, IEEE Service Center, Piscataway, NJ, USA (IEEE cat n 90CH2799-5). p 907
Publication Year: 1990
CODEN: CPACE3 ISBN: 0-8186-2030-7
Language: English
Document Type: PA; (Conference Paper) Treatment: T; (Theoretical)
Journal Announcement: 9102
Abstract: Summary form only given. The problem of reducing the cost of a multiprocessor system without losing system efficiency is investigated. The author proposes a simplified **tree architecture** , called the compressed **tree** machine. Let T(d) denote the complete binary **tree** of 2**d -1 **nodes** and T//c(d) denote a compressed **tree** corresponding to T(d). P(T) and L(T) are used to denote the number of processors and the **number** of **links** of **tree** T, respectively. It is shown that P(T//c(d)) equals (5/6)P(T(d)). L(T//c(d)) equals (5/6)L(T(d)). The author also shows that most efficient algorithms on T(d), which extensively utilize the binary **tree** structure of the interconnection network, can be slightly **modified** so that they perform the same on compressed **tree** machine T//c(d). For computation intensive applications, the author presents a simple load **balancing** method for compressed **tree** machines which guarantees the optimal simulation of **tree** machines in terms of the **speed** and number of processors. H- **tree layouts** are presented for compressed **trees** T//c(d). Let A(T(d)) and A(T//c(d)) represent the area of the H- **tree layout** of complete **tree** T(d) and the area of the author's H- **tree layout** of compressed **tree** T//c(d) respectively. It is also shown that A(T//c(d)) equals 5/9A(T(d)). Considering the ratio 5/6 between P(T//c(d)) and P(T(d)) (L(T//c(d))) and L(T(d)), this reduction in **layout** area is significant. The results provide a tradeoff between different objectives in designing **tree** -based parallel computer **architectures** .
Descriptors: COMPUTER SYSTEMS, DIGITAL--*Multiprocessing; COMPUTER **ARCHITECTURE** ; MATHEMATICAL TECHNIQUES-- **Trees**
Identifiers: BINARY **TREES** ; SUMMARY ONLY; COMPRESSED **TREE** MACHINES; LOAD **BALANCING**
Classification Codes:
723 (Computer Software); 722 (Computer Hardware); 921 (Applied Mathematics)
72 (COMPUTERS & DATA PROCESSING); 92 (ENGINEERING MATHEMATICS)

13/5/16 (Item 2 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online
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01324439 ORDER NO: AAD93-33723
ROUTING **IN LINEAR LIGHTWAVE NETWORKS (OPTICAL NETWORKS)**
Author: BALA, KRISHNA
Degree: PH.D.
Year: 1993
Corporate Source/Institution: COLUMBIA UNIVERSITY (0054)
Adviser: THOMAS E. STERN
Source: VOLUME 54/07-B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3758. 142 PAGES
Descriptors: ENGINEERING, ELECTRONICS AND ELECTRICAL
Descriptor Codes: 0544

Dynamic **routing** of point-to-point and multicast connections in a Waveband Selective Linear Lightwave Network is addressed. Linear Lightwave Networks are all optical networks in which only linear operations are performed on signals in a waveband selective manner. Each pair of **nodes** can have multiple fibers connecting them. Special constraints arise because of linearity in the LLN. Given a request for a point-to-point or multicast **connection** , the **most** used waveband (MAXBAND) is first chosen for the call. Another heuristic, MINBAND which **allocates** the least used waveband did not perform as well. Once a waveband is selected, the problem of finding a path satisfying all the **routing** constraints, for both point-to-point and multicasting connections, is shown to be NP-Complete.

For point-to-point connections within a waveband, the **routing** problem is decomposed into the sub-problems of finding a path, checking for feasibility of the path and channel **allocation** . For finding paths, K-SP, BLOW-UP and MIN-INT algorithms were proposed. A recursive algorithm checks for feasibility on the path. The problem of channel **allocation** allowing calls to retune to different channels is shown to be NP-Complete. For the case where only the incoming call can be **allocated** a new channel, MIN and MAX channel **allocation** policies are presented. Simulations showed that using MAXBAND (waveband), MIN-INT (path) and MIN (channel) resulted in least blocking.

For multicasting within a waveband, the LLN is decomposed into edge disjoint **trees** using MAX **Trees** , Dense **Trees** and MAX Degree Dense **Trees** heuristics. Each transmitter/receiver attached to a **node** has access to all edge disjoint **trees** that pass through the **node** . The **routing** problem is decomposed into the sub-problems of choosing one edge disjoint **tree** , checking for feasibility (as in point-to-point case) and channel **allocation** (as in point-to-point, MIN and MAX policies). A **tree** is chosen for a call using Smallest Component **Tree** (SCT), Minimum Interference **Tree** (MIT) or Most Used **Tree** (MUT) approaches. Simulations showed that given a chosen waveband, using MAX Degree Dense **Trees** (**tree** decomposition), MIT (**tree** selection) and MIN policy (channel) gave least blocking. Finally for multicasting, the multi-waveband case is also addressed.

13/5/28 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus
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01447688 JICST ACCESSION NUMBER: 92A0061842 FILE SEGMENT: JICST-E
Multicast Routing **Strategies Considering the** Number **of** Branch **at Exchanging** Node .
SAKAI YASUHARU (1); TODE HIDEKI (1); YAMAMOTO MIKI (1); OKADA HIROMI (1); TEZUKA YOSHIKAZU (1)
(1) Osaka Univ., Faculty of Engineering
Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku(IEIC Technical Report (Institute of Electronics, Information and Communication Enginners), 1991, VOL.91,NO.333(SSE91 94-106), PAGE.29-34, FIG.11
JOURNAL NUMBER: S0532BBG
UNIVERSAL DECIMAL CLASSIFICATION: 621.395.33/.38
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: Multicast **routing** problem is one of the essential problems for supporting multicast and broadcast communication services in ATM networks. In packet type networks, a packet for multicast communication should go through the **tree** shaped path as making its copies at an exchanging **node** for efficient use of network resources. However, concentration of packet copy operation at a particular **node** causes performance degradation of other calls which go through this **node** . In this paper we propose two multicast **routing** algorithms which destribute packet copy operations throughout **nodes** in the multicast path; a link added type algorithm and a loop constructed type algorithm. Computer simulation results show that proposed algorithms can decrease the burden of copy operation of packets per a **node** at a sacrifice of increase of average distance between source and destinations, furthermore the sacrifice of total cost is very small. (author abst.)
DESCRIPTORS: **routing** ; computer simulation; link **branching** ; **traffic** processing; graph theory; digital communication; integrated communication network; packet switching; simultaneous transmission
BROADER DESCRIPTORS: selection; communication operation; operation(processing); computer application; utilization; simulation; link operating; treatment; mathematics; theory; communication system; method; communication network; information network; network; store-and-forward switching; communication exchanging; exchange; switching
CLASSIFICATION CODE(S): ND11020E

13/5/30 (Item 1 from file: 6)
DIALOG(R)File 6:NTIS
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0444835 NTIS Accession Number: AD-779 369/8/XAB
Optimal Linear Arrangement **and Optimal Linear Ordering**
(Technical summary rept)
Adolphson, D. ; Hu, T. C.
Wisconsin Univ Madison Mathematics Research Center
Corp. Source Codes: 221200
Report No.: MRC-TSR-1144
Mar 74 46p
Journal Announcement: GRAI7415
Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A03/MF A01
Contract No.: DA-31-124-ARO(D)-462; NSF-GJ-28339
Consider a set of n pins and a required **number** of wire **connections** between each pair of the pins. The problem is to put the n pins into n holes such that the total wire length is a minimum. The holes are all in a line with adjacent holes at unit distance apart. The authors can abstract the pins and wire connections as a graph G with n **nodes** and numbers associated with the arcs. For an arbitrary G, a lower bound is established on the total wire length. If G is a rooted **tree** , an algorithm is presented which requires O(n log n) operations. (**Modified** author abstract)
Descriptors: *Network flows; Matrices(Mathematics); Graphics; Theorems
Identifiers: Graph theory; *Linear **arrangement** problem; **Trees** (Mathematics); NTISA
Section Headings: 72E (Mathematical Sciences--Operations Research)

Set	Items	Description
S1	263198	TREE? ? OR DIRECTOR? OR BRANCH?
S2	673690	TOPOLOG? OR OPTIMI? OR ROUT? OR LAYOUT? OR ARRANGEMENT? OR ARCHITECTUR?
S3	1418801	BALANC? OR ALLOCAT? OR BANDWIDTH? OR PRIORIT? OR SPEED? OR TRAFFIC?
S4	5430	(NUMBER? OR AMOUNT? OR QUANTIT? OR MOST? OR LEAST? OR FEWE-ST?)(N)(LINK? OR PORT? ? OR CONNECTION? OR OUTPUT?)
S5	128	S1 AND S4
S6	29	S5 AND (S2 OR S3)
S7	13	S6 AND IC=G06F?
S8	1	S1 AND S2 AND S3 AND S4
S9	116	S2 AND S3 AND S4
S10	2671	(MULTIPL? OR PLURAL? OR SEVERAL? OR VARIOUS? OR MANY?)(N)(-NODE? OR INTERSECT?)
S11	1	S9 AND S10
S12	3063	MC=(T01-C0C5 OR T01-C07D OR T01-J30)
S13	1199	MC=T01-C07C5
S14	4226	(S12 OR S13)
S15	6	S4 AND S14
S16	1833	S2 AND S3 AND S1
S17	863	S16 AND (PORT? OR LINK? OR CONNECTION? OR OUTPUT?)
S18	1	S17 AND S14
S19	1	S18 NOT S11
S20	413	S17 AND (NUMBER? OR AMOUNT? OR QUANTIT? OR MOST? OR LEAST? OR FEW OR FEWEST OR FEWER OR MORE OR GREATER OR LESS OR NUMBER OR COUNT)
S21	193	S20 AND IC=(G06F? OR H04L?)
S22	193	S21 AND S1
S23	3203	S1(5N)S2
S24	52	S21 AND S23
S25	52	S24 NOT S7
S26	4	S25 AND (BUS? ? OR SERIALBUS? OR 1394)
S27	21	S25 AND IC=(G06F-001? OR H04L-012?)
S28	19	S27 NOT S26
S29	680	S14 AND IC=(G06F-001? OR H04L-012?)
S30	10	S29 AND S1
S31	10	S30 NOT S28
S32	0	S20 AND S29
S33	263198	TREE? ? OR DIRECTOR? OR BRANCH?
S34	673690	TOPOLOG? OR OPTIMI? OR ROUT? OR LAYOUT? OR ARRANGEMENT? OR ARCHITECTUR?
S35	1753592	BALANC? OR ALLOCAT? OR REALLOCAT? OR ASSIGN? OR REASSIGN? - OR MODIF? OR BANDWIDTH? OR PRIORIT? OR SPEED? OR TRAFFIC?
S36	72890	NODE?
S37	313	S33 AND S34 AND S35 AND S36
S38	92748	(NUMBER? OR AMOUNT? OR QUANTIT? OR MOST OR LEAST OR FEWEST OR FEW OR FEWER OR GREATER OR COUNT)(2N)(BRANCH? OR CONNECTIO-N? OR PORT? OR LINK?)
S39	24	S37 AND S38
S40	20	S39 AND IC=(G06F? OR H04L?)
S41	20	S40 NOT (S31 OR S28)
S42	20	IDPAT (sorted in duplicate/non-duplicate order)
S43	20	IDPAT (primary/non-duplicate records only)

File 347:JAPIO Oct 1976-2003/Mar(Updated 030703)
(c) 2003 JPO & JAPIO
File 350:Derwent WPIX 1963-2003/UD,UM &UP=200347
(c) 2003 Thomson Derwent

43/5/18 (Item 18 from file: 347)
DIALOG(R)File 347:JAPIO
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05809841 **Image available**
ARRAY **LAYOUT** METHOD

PUB. NO.: 10-092941 [JP 10092941 A]
PUBLISHED: April 10, 1998 (19980410)
INVENTOR(s): KAMIJO YASUSHI
APPLICANT(s): SEIKO EPSON CORP [000236] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 08-245341 [JP 96245341]
FILED: September 17, 1996 (19960917)
INTL CLASS: [6] H01L-021/82; **G06F-017/50**
JAPIO CLASS: 42.2 (ELECTRONICS -- Solid State Components); 45.4 (INFORMATION PROCESSING -- Computer Applications)

ABSTRACT

PROBLEM TO BE SOLVED: To provide a high-quality IC in the **layout** method of cells of gate arrays and standard cell circuits by automatically holding the **branch** wiring lengths equal at executing the **layout** to reduce the error from a virtual wiring capacitance value.

SOLUTION: Wirings connected to cells have **branches** . The **number** of the wiring **branches** is judged to determine the cell arraying **priority** such that the wiring starts with a cell having the largest **number** of **branches** . If e.g. information is obtained such that the output **branch** **number** of **branches** of the cells are A>B=C=D=E=F before **layout** , then cells of A are first arrayed and other those of C, D, E are arrayed close to those of A at the same time. Cells of B, F are arrayed as close as possible to those of D, E. Since the **layout** starts with the cells of A, the lengths of **nodes** 22, 23, 26 are held approximately equal.

43/5/16 (Item 16 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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004160410
WPI Acc No: 1984-305949/198449
XRPX Acc No: N84-228131

Electronic circuit composing computer - has shift register taken to matrix buffer store and via switch to OR-gate counter reset flip-flop

Patent Assignee: TAGANROG WIRELESS ENG (TAWI)
Inventor: GLUSHAN V N; KUREICHIK V M; SHCHERBAKO L I
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SU 1086434	A	19840415	SU 3466793	A	19820707	198449	B

Priority Applications (No Type Date): SU 3466793 A 19820707
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
SU 1086434	A		13		

Abstract (Basic): SU 1086434 A

Main new circuit components are five shift registers, two decoders, three buffer registers, switch, n sorters (where n is the number of **nodes** in the graph), each with two AND-gates and flip-flop, as well as matrix buffer memory, matrix memory, comparator, delay lines, adder-subtracter, two comparators and indicator.

The original circuit contains a graph display in which each input corresponds to a graph **node** and each output to a **branch** between a pair of **nodes** . The original graph is entered in such a way that if a '1' signal is applied to the graph display, it appears at those outputs which represent **branches** linking the **nodes** to which it was applied. In this way **nodes** with the largest (smallest) **number** of **branches** can be identified. The switch is used to select a number of **nodes** representing the required number of subgraphs, each of these **nodes** being used to connect other **nodes** . The process of formation of each subgraph ends when the first shift register produces an overflow signal. Subgraphs are formed consecutively; the result is entered in the matrix memory and displayed, and the total **number** of **connections** is stored in the third buffer register. The **nodes** with the largest **number** of **connections** are then eliminated from the next stage of analysis, and the next **node** with a smaller **number** of **connections** is selected for that stage. Once two stages have been completed, their results are compared, and the result stored in the buffer matrix memory.

USE/ADVANTAGE - The circuit is a specialised electronic circuit design aid which can divide graphs into sub-graphs and simulate graph properties. In its **modified** version it provides the additional facility of solving problems of synthesis which consist in subdividing the original connected graph into subgraphs and **optimising** the **number** of **connections** between them, with the **nodes** of each subgraph numbered. Bul.14/15.4.84.

(13pp Dwg.No.0/3

Title Terms: ELECTRONIC; CIRCUIT; COMPOSE; COMPUTER; SHIFT; REGISTER; MATRIX; BUFFER; STORAGE; SWITCH; OR-GATE; COUNTER; RESET; FLIP-FLOP
Derwent Class: T01
International Patent Class (Additional): **G06F-015/20**
File Segment: EPI

43/5/14 (Item 14 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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007243968
WPI Acc No: 1987-240975/198734
XRPX Acc No: N87-180115

Network characteristics determn. unit - has topology **modelling unit stopping analysis of** branches **after decoder signal passes through operational unit field**

Patent Assignee: AS UKR POWER MODELL (AUPO-R)
Inventor: DODONOV A G; MINCHENKO L I; PELEKHOV S P
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SU 1282151	A	19870107	SU 3806351	A	19841025	198734	B

Priority Applications (No Type Date): SU 3806351 A 19841025
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
SU 1282151	A		13		

Abstract (Basic): SU 1282151 A

Appts. comprises completed events numbers memory (31), **number** of **branches** input memory (32), subtractor (33), registers (34-36), final section number register (37), zero state decoder (38), codes comparator (39), commutators (40,41), triggers (42,43,52), AND-gates (44-51), OR-gate (53), NOT-gate (54), delay elements (55-58), all forming the operational unit (1), plus **topology** modelling unit (2), characteristics calculator (3) and clock oscillator (4). **Speed** is increased by the introduction to the **topology** modelling unit of two commutators, initial unit number register and delay element.

Initial grid **topology** data is first entered in memory elements along with records of **branches** . Another memory receives width or duration codes plus the **number** of **branchey** entered in a given **node** .

A start signal is applied from an input field to the **topology** modelling unit and logic switching is carried out to enable reading of the first **branch** from a memory and a zero code corresp. to an earlier completed event.

The read-out value code passes to a register and subtractor (33) reduces the **number** of **Branches** held in memory (32) by one. The difference code formed passes to register (34) along with a control pulse and if the code is greater than zero, this indicates that not all **branches** have been analysed and that the operational unit has not executed any operations for a particular control pulse. Control pulse shaping is then blocked.

USE/ADVANTAGE - Appts. is esp. for specialised data processes in e.g. specialised computers for modelling operational control set tasks. Bul.1/7.1.87

Dwg.1/3

Title Terms: NETWORK; CHARACTERISTIC; DETERMINE; UNIT; **TOPOLOGICAL** ; MODEL ; UNIT; STOP; ANALYSE; **BRANCH** ; AFTER; DECODE; SIGNAL; PASS; THROUGH; OPERATE; UNIT; FIELD
Derwent Class: T01
International Patent Class (Additional): **G06F-015/20**
File Segment: EPI

43/5/6 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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010967605 **Image available**
WPI Acc No: 1996-464554/199646
Related WPI Acc No: 1996-209036; 1996-239075; 1998-206921
Inter-nodal traffic **load** assigning **method to channels in SONET rings - involves minimising MIP in accordance with** traffic routing **and imposed mathematical bounds and storing** optimised traffic **load** assignment **information corresponding to minimised MIP in memory of computer**
Patent Assignee: US WEST TECHNOLOGIES INC (USWT-N)
Inventor: LEE Y; QIU Y; RYAN J; SUN X
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5564021	A	19961008	US 94252035	A	19940531	199646	B

Priority Applications (No Type Date): US 94252035 A 19940531
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5564021	A		12	G06F-015/20	

Abstract (Basic): US 5564021 A

The method involves generating Mixed Integer Program (MIP) to model the cost of SONET Terminal multiplexers, SONET Add/Drop Multiplexers and corresponding interface ports necessary to **route** the **traffic** loads. The MIP is minimised in accordance with the **traffic routing** and the imposed mathematical bounds. **Optimized traffic** load **assignment** information corresponding to the minimized MIP are stored in the memory of the computer. Intermodal **traffic** loads are **assigned** to channels in the **assignment** rings in accordance with the **optimized traffic** load **assignment** information. A bound on the maximum number of the SONET Terminal and SONET Add/Drop multiplexers are determined over a maximum number of multiplexers that could be used at a given **node** . Selected multiplexers are pre- **assigned** at selected **nodes** to selected channels in order to reduce the **number** of symmetric **branches** processed by the MIP.

ADVANTAGE - Allows user to determine optimum solution for **traffic routing** and number of multiplexer and interface ports.

Dwg.1/2
Title Terms: INTER; **NODE** ; **TRAFFIC** ; LOAD; **ASSIGN** ; METHOD; CHANNEL; SONET; RING; MINIMISE; ACCORD; **TRAFFIC** ; **ROUTE** ; IMPOSE; MATHEMATICAL; BOUND; STORAGE; OPTIMUM; **TRAFFIC** ; LOAD; **ASSIGN** ; INFORMATION; CORRESPOND; MINIMISE; MEMORY; COMPUTER
Derwent Class: T01
International Patent Class (Main): **G06F-015/20**
International Patent Class (Additional): **G06F-009/312**
File Segment: EPI

43/5/8 (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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010344503 **Image available**
WPI Acc No: 1995-246591/199532
XRPX Acc No: N95-191493

Widest path routing **method for information networks - extending Dijkstra** routing **method by applying bottleneck metrics to determine link weights and path** routes

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)
Inventor: LE BOUDEC J; PRZYGIENDA A; SULTAN R; PRZYGIENDA A B
Number of Countries: 020 Number of Patents: 008
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9518498	A1	19950706	WO 93EP3683	A	19931224	199532	B
EP 736237	A1	19961009	WO 93EP3683	A	19931224	199645	
			EP 94904184	A	19931224		
JP 9504671	W	19970506	WO 93EP3683	A	19931224	199728	
			JP 95517738	A	19931224		
EP 736237	B1	19990616	WO 93EP3683	A	19931224	199928	
			EP 94904184	A	19931224		
DE 69325398	E	19990722	DE 625398	A	19931224	199935	
			WO 93EP3683	A	19931224		
			EP 94904184	A	19931224		
US 6016306	A	20000118	WO 93EP3683	A	19931224	200011	
			US 96666377	A	19960912		
JP 3084066	B2	20000904	WO 93EP3683	A	19931224	200045	
			JP 95517738	A	19931224		
KR 218624	B1	19990901	WO 93EP3683	A	19931224	200104	
			KR 96703171	A	19960615		

Priority Applications (No Type Date): WO 93EP3683 A 19931224
Cited Patents: EP 276754; EP 348327; EP 423053; EP 447725; EP 498967; US 4905233; US 5067127; US 5088032
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9518498	A1	E	25	H04L-012/56	
Designated States (National): CA JP KR US					
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE					
EP 736237	A1	E	25	H04L-012/56	Based on patent WO 9518498
Designated States (Regional): DE FR GB IT NL					
JP 9504671	W		31	H04L-012/28	Based on patent WO 9518498
EP 736237	B1	E		H04L-012/56	Based on patent WO 9518498
Designated States (Regional): DE FR GB IT NL					
DE 69325398	E			H04L-012/56	Based on patent EP 736237
					Based on patent WO 9518498
US 6016306	A			G06F-013/00	Based on patent WO 9518498
JP 3084066	B2		12	H04L-012/28	Previous Publ. patent JP 9504671
					Based on patent WO 9518498
KR 218624	B1			H04L-012/56	

Abstract (Basic): WO 9518498 A

The **routing** method involves **assigning** each link a link weight, reflecting a selected link characteristic. The weight of concatenated path(s) is determined by the link weights o its components. The weights of all the paths determine the best path.

A best path **tree** is constructed from the source to destination(s) using a **topology** database containing the **nodes** , attached links and link weights for each path. A subset is selected containing at **least** one **link** from the set of component links by applying an operation on the link weights of the paths components links. A path weight is determined for the path from the link weights of its selected links. Pref., an extremum of the component link weights is used for the sub-set selection.

USE/ADVANTAGE - Switch based computer network. Can determine

''best'' path, which is defined to include ''widest'' bottleneck, that is **link** with **most** favourable (smallest or biggest) weight.
Dwg.1A/4
Title Terms: WIDE; PATH; **ROUTE** ; METHOD; INFORMATION; NETWORK; EXTEND; **ROUTE** ; METHOD; APPLY; BOTTLENECK; DETERMINE; LINK; WEIGHT; PATH; **ROUTE**
Derwent Class: T01; W01
International Patent Class (Main): **G06F-013/00** ; **H04L-012/28** ; **H04L-012/56**
International Patent Class (Additional): H04Q-003/00; H04Q-011/04
File Segment: EPI

43/5/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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013050268 **Image available**
WPI Acc No: 2000-222122/200019
XRPX Acc No: N00-166227
Bandwidth **distribution method in high** speed **packet switching network**
Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)
Inventor: BERTIN O; GALAND C; MAUREL O
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6011804	A	20000104	US 96771333	A	19961216	200019	B

Priority Applications (No Type Date): EP 95480178 A 19951220
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6011804	A		18	H04J-003/16	

Abstract (Basic): US 6011804 A
NOVELTY - Updated network **topology** information is stored in network **topology** database (306). Based on evaluation of the expected control **traffic** on each link, a network **bandwidth** fraction, ft=(FcstasteriskCMcst)+(NrefasteriskCTref)+(NbaasteriskCTba)+(STasteriskLasteriskCTtu)/C is calculated. The **bandwidth** fraction is recalculated every time the network **topology** changes.

DETAILED DESCRIPTION - The calculated network **bandwidth** fraction is ft=(FcstasteriskCMcst)+(NrefasteriskCTref)+(NbaasteriskCTba)+(STasteriskLasteriskCTtu)/C, here Fcst is the average **number** of **connections** setup or taken down per second on a link, CMcst is the average size in bits required to setup or take down a connection on a link, Nref is the **number** of **connection** with **bandwidth** refreshed, CTref is the capacity in bits per second required to refresh a connection on a link having predetermined refresh period, Nba is the **number** of **connection** with **bandwidth** adjustment, CTba is the capacity in bits per second required to perform **bandwidth** adjustment for a connection on a link having a predetermined adjustment period, ST is equal to 1 for a link in network spanning **tree** and 0 for all other links, L is the total **number** of **links** in the network, CTtu is the capacity in bits per second required by the **topology** database to update messages on a link having a predetermined average **topology** database message period, C is the link capacity in bits per second. The calculated **bandwidth** fraction aids in determining **bandwidth** required for transmission of control packets.

USE - In high **speed** packet switching network.

ADVANTAGE - By updating the network **topology** in every **node** , dynamic network configurations without disrupting end user's logical corrections, is facilitated. By **allocating** **bandwidth** according to expected control **traffic** on each link, utilization of the communication facilities of the packet network is **optimized** to carry more **traffic** .

DESCRIPTION OF DRAWING(S) - The figure shows high **speed** **routing** point in network **node** .

Network **topology** database (306)

pp; 18 DwgNo 3/9

Title Terms: **BANDWIDTH** ; DISTRIBUTE; METHOD; HIGH; **SPEED** ; PACKET; SWITCH ; NETWORK
Derwent Class: T01; W01
International Patent Class (Main): H04J-003/16
International Patent Class (Additional): G01R-031/08; **H04L-012/28**
File Segment: EPI

28/5/4 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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015355046 **Image available**
WPI Acc No: 2003-415984/200339
XRPX Acc No: N03-331493

Routing connection **distribution** tree **creation method in asynchronous transfer mode network, involves dynamically creating distribution** tree **according to** routing **selection mode, for point-to-point** connection **, based on** traffic **metrics**

Patent Assignee: CISCO TECHNOLOGY INC (CISC-N)
Inventor: CHENG D
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6529498	B1	20030304	US 9869069	A	19980428	200339	B
			US 98107038	A	19980629		
			US 98172109	A	19981013		

Priority Applications (No Type Date): US 98172109 A 19981013; US 9869069 A 19980428; US 98107038 A 19980629
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6529498	B1		16	H04L-012/28	CIP of application US 9869069
					CIP of application US 98107038

Abstract (Basic): US 6529498 B1

NOVELTY - A distribution **tree** representing a point-to-multipoint **connection** within a computer network, is dynamically created according to **routing** selections made for one or **more** point-to-point **connection** of the point-to-multipoint **connection** , based on **traffic** metrics advertised for service classes within the network.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) point-to-multipoint **connection** distribution table generating method;

(2) distribution table;

(3) point-to-multipoint **connection** distribution **tree** creating apparatus; and

(4) point-to-multipoint **connection** distribution table generating apparatus.

USE - In asynchronous transfer mode (ATM) networks.

ADVANTAGE - Enables creating distribution **tree** , representing **routes** within the computer network **optimized** to share the **routing** selections made for the point-to-point **connection** .

DESCRIPTION OF DRAWING(S) - The figure shows a functional diagram for a private network-to-network or node-to-node interface **routing** agent's major data structures and interfaces.

pp; 16 DwgNo 3/8

Title Terms: **ROUTE** ; CONNECT; DISTRIBUTE; **TREE** ; CREATION; METHOD; ASYNCHRONOUS; TRANSFER; MODE; NETWORK; DYNAMIC; DISTRIBUTE; **TREE** ; ACCORD; **ROUTE** ; SELECT; MODE; POINT; POINT; CONNECT; BASED; **TRAFFIC**
Derwent Class: W01
International Patent Class (Main): **H04L-012/28**
File Segment: EPI

28/5/7 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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013714789 **Image available**
WPI Acc No: 2001-199013/200120
XRPX Acc No: N01-142861

Hierarchical-structure determination method for computer network peripheral device connection **, involves removing loop which neither transmits nor receives request marker, in** tree **-like** topology **of connected network**

Patent Assignee: HEWLETT-PACKARD CO (HEWP)
Inventor: LE T V
Number of Countries: 002 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 2001024684	A	20010126	JP 2000176197	A	20000613	200120	B
US 6496485	B1	20021217	US 99332796	A	19990614	200307	

Priority Applications (No Type Date): US 99332796 A 19990614
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2001024684	A		7	H04L-012/44	
US 6496485	B1			H04L-012/413	

Abstract (Basic): JP 2001024684 A

NOVELTY - Each connected node of **tree** structure has an unique **priority number** . The **priority number** of connected nodes are compared. The adjacent nodes other than higher **priority** node transmits request marker to higher **priority** node. The loop in which request marker is neither transmitted nor received, is removed from the **tree** -like **topology** .

USE - For determining hierarchical-structure for connecting computer network and peripheral device

DESCRIPTION OF DRAWING(S) - The figure shows the explanatory diagram of hierarchical-structure determination method.

pp; 7 DwgNo 4/4

Title Terms: HIERARCHY; STRUCTURE; DETERMINE; METHOD; COMPUTER; NETWORK; PERIPHERAL; DEVICE; CONNECT; REMOVE; LOOP; NEITHER; TRANSMIT; NOR; RECEIVE; REQUEST; MARK; **TREE** ; **TOPOLOGICAL** ; CONNECT; NETWORK
Derwent Class: T01; W01
International Patent Class (Main): **H04L-012/413** ; **H04L-012/44**
International Patent Class (Additional): **G06F-013/38** ; **H04L-012/28**
File Segment: EPI

28/5/10 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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010298725 **Image available**
WPI Acc No: 1995-199985/199526
XRPX Acc No: N95-157101

High speed **switched network** architecture **- has** number **of switching nodes each of which is connected to one or** more **incoming** links **from which data is received**

Patent Assignee: UNIV COLUMBIA NEW YORK (UYCO)
Inventor: FLORISSI D; YEMINI Y W; YEMINI Y
Number of Countries: 021 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5418779	A	19950523	US 94213710	A	19940316	199526	B
WO 9525393	A1	19950921	WO 95US1313	A	19950131	199543	
EP 770295	A1	19970502	EP 95908773	A	19950131	199722	
			WO 95US1313	A	19950131		
KR 97701958	A	19970412	WO 95US1313	A	19950131	199817	
			KR 96705124	A	19960916		
JP 11503881	W	19990330	JP 95524017	A	19950131	199923	
			WO 95US1313	A	19950131		
KR 324092	B	20020624	WO 95US1313	A	19950131	200281	
			KR 96705124	A	19960916		

Priority Applications (No Type Date): US 94213710 A 19940316
Cited Patents: US 5138615; US 5150360; US 5331637
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5418779	A		19	H04L-012/48	
WO 9525393	A1		45	H04L-012/46	
Designated States (National): CA JP KR					
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE					
EP 770295	A1	E	19	H04L-012/46	Based on patent WO 9525393
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE					
KR 97701958	A			H04L-012/56	Based on patent WO 9525393
JP 11503881	W		39	H04L-012/46	Based on patent WO 9525393
KR 324092	B			H04L-012/56	Previous Publ. patent KR 97701958
					Based on patent WO 9525393

Abstract (Basic): US 5418779 A

The network includes a **number** of switching nodes interconnected with one another with communications **links** . Each switching node is connected to one or **more** incoming **links** from which the switching node receives data and to one or **more** outgoing **links** to which the switching node transfers the data. The network further includes a device for providing configuration information on **routing trees** involving the switching node. Each of the **routing trees** specifies **routing** of the data through the switching node.

The network also incorporates a device for defining a sequence of time bands. Each time band is associated with one or **more** of the **routing trees** . Also included is a device for receiving configuration information on the one or **more** of the **routing trees** for particular time bands associated with it.

USE/ADVANTAGE - For multimedia networking for applications such as video multi-casting, multimedia conference, high quality image retrieval and virtual reality environment. Eliminate complex frame processing by switching nodes to increase processing **speed** while supporting **number** of protocol.

Dwg.6/11

Title Terms: HIGH; **SPEED** ; SWITCH; NETWORK; **ARCHITECTURE** ; **NUMBER** ; SWITCH; NODE; CONNECT; ONE; **MORE** ; INCOMING; **LINK** ; DATA; RECEIVE
Derwent Class: W01
International Patent Class (Main): **H04L-012/46** ; **H04L-012/48** ; **H04L-012/56**

International Patent Class (Additional): **H04L-012/28 ; H04L-012/66 ;**
H04Q-011/04

11/5/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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012934072 **Image available**
WPI Acc No: 2000-105919/200009
XRPX Acc No: N00-081331
Topology optimization **method for IEEE 1394 serial bus of multimedia instruments e.g. HDTV, DVD, DVC**
Patent Assignee: SAMSUNG ELECTRONICS CO LTD (SMSU)
Inventor: CHEN W; LEE Y G; JIN W; LEE Y J
Number of Countries: 022 Number of Patents: 007
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9964943	A2	19991216	WO 99KR291	A	19990612	200009	B
EP 1027640	A2	20000816	EP 99925442	A	19990612	200040	
			WO 99KR291	A	19990612		
KR 2000001563	A	20000115	KR 9821903	A	19980612	200059	
CN 1273652	A	20001115	CN 99800897	A	19990612	200115	
KR 298979	B	20010906	KR 9821903	A	19980612	200227	
JP 2002517967	W	20020618	WO 99KR291	A	19990612	200242	
			JP 2000553880	A	19990612		
JP 3295074	B2	20020624	WO 99KR291	A	19990612	200243	
			JP 2000553880	A	19990612		

Priority Applications (No Type Date): KR 9821903 A 19980612
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9964943	A2	E	23	G06F-000/00	
Designated States (National): CN JP US					
Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE					
EP 1027640	A2	E		G06F-001/00	Based on patent WO 9964943
Designated States (Regional): DE GB					
KR 2000001563	A			H04L-012/28	
CN 1273652	A			G06F-013/14	
KR 298979	B			G11B-020/10	Previous Publ. patent KR 2000001563
JP 2002517967	W		25	H04L-012/28	Based on patent WO 9964943
JP 3295074	B2		7	H04L-012/28	Previous Publ. patent JP 200217967
					Based on patent WO 9964943

Abstract (Basic): WO 9964943 A2

NOVELTY - The serial bus comprises **multiple nodes** , each with communication ports and **priority** is assigned to nodes according to their count and transmission **speed** . Then unused port in node of first **priority** is connected to port in node of second **priority** and this process is continued until all nodes are connected.

DETAILED DESCRIPTION - The total **port number** of nodes is compared with reference value which varies with number of nodes, to determine whether or condition for **topology optimization** is satisfied. **Priority** is assigned to nodes only if the condition is satisfied.

USE - For IEEE 1394 serial bus used in multimedia instruments such as HDTV, DVD, DVC.

ADVANTAGE - Enables construction of **topology** which increases **speed** capacity of each node in bus.

DESCRIPTION OF DRAWING(S) - The figure shows the flow chart illustrating **topology optimization** method.

pp; 23 DwgNo 2/4

Title Terms: **TOPOLOGICAL** ; OPTIMUM; METHOD; SERIAL; BUS; INSTRUMENT; HDTV
Derwent Class: T01
International Patent Class (Main): G06F-000/00; G06F-001/00; G06F-013/14; G11B-020/10; H04L-012/28
International Patent Class (Additional): G06F-013/00; G06F-013/18; G06F-013/20; G06F-013/26; G06F-013/28; G06F-013/30; G06F-013/36; G06F-013/38; H04L-012/44
File Segment: EPI

```
Set     Items   Description
S1         91   (HIERARCH? OR INVERT? OR PYRAMID?)(N)(TOPOLOG?)(5N)(BUS? ?
             OR 1394)
S2         15   S1(S)(TREE OR TREES OR DIRECTOR?)
S3         15   RD (unique items)
S4          4   S2 NOT PY>1998
File   2:INSPEC 1969-2003/Jul W2
         (c) 2003 Institution of Electrical Engineers
File   8:Ei Compendex(R) 1970-2003/Jul W2
         (c) 2003 Elsevier Eng.  Info. Inc.
File  16:Gale Group PROMT(R) 1990-2003/Jul 24
         (c) 2003 The Gale Group
File  20:Dialog Global Reporter 1997-2003/Jul 24
         (c) 2003 The Dialog Corp.
File  95:TEME-Technology & Management 1989-2003/Jul W1
         (c) 2003 FIZ TECHNIK
File 148:Gale Group Trade & Industry DB 1976-2003/Jul 24
         (c)2003 The Gale Group
File 275:Gale Group Computer DB(TM) 1983-2003/Jul 24
         (c) 2003 The Gale Group
File 315:ChemEng & Biotec Abs 1970-2003/Jun
         (c) 2003 DECHEMA
File 340:CLAIMS(R)/US Patent 1950-03/Jul 22
         (c) 2003 IFI/CLAIMS(R)
File 342:Derwent Patents Citation Indx 1978-01/200328
         (c) 2003 Thomson Derwent
File 345:Inpadoc/Fam.& Legal Stat 1968-2003/UD=200328
         (c) 2003 EPO
File 348:EUROPEAN PATENTS 1978-2003/Jul W02
         (c) 2003 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20030717,UT=20030710
         (c) 2003 WIPO/Univentio
File 351:Derwent WPI 1963-2003/UD,UM &UP=200347
         (c) 2003  Thomson Derwent
File 613:PR Newswire 1999-2003/Jul 24
         (c) 2003 PR Newswire Association Inc
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Jul 24
         (c) 2003 The Gale Group
File 649:Gale Group Newswire ASAP(TM) 2003/Jul 17
         (c) 2003 The Gale Group
File 654:US PAT.FULL. 1976-2003/Jul 22
         (c) FORMAT ONLY 2003 THE DIALOG CORP.
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4/5,K/3 (Item 1 from file: 654)
DIALOG(R)File 654:US PAT.FULL.
(c) FORMAT ONLY 2003 THE DIALOG CORP. All rts. reserv.

4014545 **IMAGE Available
Derwent Accession: 1998-427460
Utility
E/ Token style arbitration on a serial bus by passing an unrequested bus grand signal and returning the token by a token refusal signal
; IN AN ELECTRONIC SYSTEM
Inventor: Duckwall, William S., Santa Cruz, CA
Assignee: Apple Computer, Inc. (02), Cupertino, CA
Apple Computer Inc (Code: 24852)
Examiner: Dung, Dinh C. (Art Unit: 276)
Law Firm: Blakely, Sokoloff, Taylor & Zafman

	Publication Number	Kind	Date	Application Number	Filing Date
Main Patent	US 5784648	A	19980721	US 95565986	19951201

Current US Classification (Main): 710040000 (X-ref): 710120000; 710243000
US Classification on document (Main): 395860 (X-ref): 395300; 395731
International Classification (Edition 1): G06F-013/14; G06F-013/362; G06F-013/368
Examiner Field of Search (US): 39520006; 395287; 395856; 395857; 395728; 395730; 395731; 395732; 395860; 395300; 370450; 370451; 370453

Cited US Patents:

Patent Number	Date YYYYMM	Main US Class	Inventor
US 4590468	198605	3408255	Stieglitz
US 4680581	198707	34082506	Kozlik
US 4682324	198707	370447	Ulug
US 5053946	199110	30520021	Jain
US 5155725	199210	370445	Khalil
US 5394556	199502	3952005	Oprescu
US 5444847	199508	395287	Iitsuka
US 5630173	199705	395860	Oprescu

Cited non-Patent References:
Wee et al. "A Partial-Destination-Release Strategy for the Multi-Token Ring Protocol", Local Computer Networks, 1992 17th Conf.
Jabbari et al. "A Token-Passing Data Associated Protocol for Local Computer Networks", Communications, 1989 IEEE Inter. Conf.
Akhtar et al. "An Extended Token Bus Protocol for Embedded Networks", Distributed Computing Systems, 1988 Inter. Conf.
Digital Interface for Consumer Electronic Audio/Video Equipment, Draft Version 2.0, Philips Electronics N.V. Matsushita Electric Ind. Co., Ltd Thomspon multimedia Sony Corporation IEEE 1394 Trade Association Meeting, Oct., 1995, Part 1 pps. 1-47, Part 2 p.7, Part 3 pps. 1-6.
P1394 Standard for a High Performance Serial Bus, P1394 Draft 8.0v3, Oct. 16, 1995, pps. 1-384.

Fulltext Word Count: 9049
Number of Claims: 19
Exemplary or Independent Claim Number(s): 1
Number of Drawing Sheets: 18
Number of Figures: 26
Number of US cited patent references: 8
Number of non-patent cited references: 5
Calculated Expiration Date: 20151201

Abstract:
An electronic system comprises a plurality of components each having at least one communication node and being coupled together by communication links through the respective communication nodes so that the plurality of

communication links and communication nodes form a bus which resembles an acyclic directed graph having established hierarchical parent-child relationships between adjacent nodes and a root node. Token passing style arbitration is implemented on the system, in one embodiment, in response to the root node sending out an unrequested bus grant, so that the node with the token has access to the bus.

What is claimed is:

Exemplary or Independent Claim(s):

1. In an electronic system comprising a plurality of components interconnected by a plurality of communication links, said plurality of components each having at least a first communications node wherein said communications nodes interface their associated component with a communications link through a node port, said nodes being capable of having a plurality of ports to which communications links to adjacent nodes couple, each node having a predetermined selection criteria established for selecting adjacent nodes coupled through its ports, said configuration of nodes and communications links comprising a directed acyclic graph wherein one node is designated a root node, all nodes coupled to only one adjacent node are designated leaf nodes, all other nodes in the graph being designated branch nodes, said acyclic directed graph having established hierarchical parent-child relationships between all adjacent nodes proceeding from the root node down to any leaf nodes wherein a leaf node has only one parent node and all nodes adjacent to the root node are child nodes with respect to the root node but parent nodes with respect to other adjacent nodes, the root node being defined as having no parent node, a method of token passing bus arbitration wherein a metaphorical token comprising an unrequested bus grant signal is passed from node to node in a cycle through the graph, the node having the token being the node with bus access, said method comprising the step of passing the token through the acyclic directed graph in an order determined by the predetermined selection criterion each node has established for selecting adjacent nodes, said method further comprising a step of returning the token by transmitting a token-refusal signal.

Non-exemplary or Dependent Claim(s):

2. A method of token passing bus arbitration as in claim 1 wherein at least one of said plurality of communications links comprises a twisted pair.
3. A method of token passing bus arbitration as in claim 1 wherein at least one of said plurality of communication links comprises an optical fiber.
4. A method of token passing bus arbitration as in claim 1 wherein at least one of said plurality of communication links comprises a wireless coupling.
5. A method of token passing bus arbitration as in claim 1 wherein at least one of said plurality of communication links comprises a cable, the cable carrying two signal pairs and signal ground.
6. A method of token passing bus arbitration as in claim 5 wherein the cable further carries a power pair.
7. A method of token passing bus arbitration as in claim 1 wherein: the node end the data transmission by transmitting a data end signal, the data ends signal comprises a penultimate bit and an ultimate bit, wherein the penultimate bit is encoded to indicate whether a metaphorical token is being passed by the node such that when the penultimate bit is set by the node the token is passed and the node relinquishes control of the bus.
8. A data communication system comprising:
a plurality of communication nodes, each of the communication nodes having at least one communication port, at least two of the communication nodes being capable of operating in a token passing bus arbitration mode;
a plurality of communication links interconnecting logically adjacent communication nodes through associated communication ports so as to form a configuration of communication nodes and communication links, the configuration of communication nodes and communication links

comprising a serial bus;
wherein each of the communication nodes having a predetermined selection criterion established for selecting logically adjacent nodes coupled through its communication ports via one of the communication links so that the configuration of communication nodes and communication links comprise an acyclic directed graph wherein one of the communication nodes is designated a root node and one of the communication nodes is designated a token master node, all communication nodes coupled to only one adjacent communication node being designated leaf nodes, all other communication nodes being designated branch nodes, the acyclic directed graph having established parent-child relationships between all logically adjacent coupled communication nodes proceeding from the root node down to any leaf node;
wherein said token master node generates a token which is passed between the communication nodes having the capability of operating in the token passing bus arbitration mode such that the communication node in possession of the token has access to the bus; and
wherein said token comprises an unrequested bus grant signal which may be returned by transmitting a token refusal signal.

9. A data communication system as in claim 8 wherein the communication node with access to the bus transmits information on the bus in the form of data packets and indicates that it has completed transmitting information by sending a data end signal.
10. A data communication system as in claim 9 wherein the node with access to the bus passes the token by transmitting a token-passing bit pattern as part of the data end signal.
11. A data communication system as in claim 10 wherein the token-passing bit pattern comprises penultimate bit encoding where the penultimate bit of the dribble bits is set so as to indicate that the token is being passed.
12. A data communication system as in claim 11 wherein when the penultimate bit of the dribble bits is set to a logical one the token is passed.
13. A data communication system as in claim 8 wherein said communications links comprising six conductor cables, said six conductors being arranged as two signal pairs and a power pair.
14. A data communication system as in claim 8 wherein each of said communications ports of said communications nodes are arranged as an A pair and a B pair and wherein said communications links are arranged between said communications nodes so as to couple the A pair of a child node's communication port to the B pair of the child node's parent node's communication port and to couple the B pair of the child node's communication port to the A pair of the child node's parent node's communication port.
15. A data communication system as in claim 8 wherein said communication links comprising twisted pairs.
16. A data communication system as in claim 8 wherein said communications links comprising optical fibers.
17. A data communication system as in claim 8 wherein said communication links comprising wireless coupling.
18. A data communication system as in claim 8 wherein the token master is the root node.
19. A data communication system comprising:
a plurality of communication nodes, each of the communication nodes having at least one communication port, at least two of the communication nodes being capable of operating in a token passing bus arbitration mode;
a plurality of communication links interconnecting logically adjacent communication nodes through associated communication ports so as to form a configuration of communication nodes and communication links, the configuration of communication nodes and communication links comprising a serial bus;
wherein each of the communication nodes having a predetermined selection criterion established for selecting logically adjacent nodes coupled through its communication ports via one of the communication links so that the configuration of communication nodes and communication links comprising an acyclic directed graph, the

graph comprising a plurality of local clusters of said plurality of communication nodes, each of said plurality of local clusters of nodes having at least one of said communication nodes capable of operating in token passing bus arbitration mode, wherein one of the communication nodes is designated a root node and one of the communication nodes is designated a token master node, all communication nodes coupled to only one adjacent communication node being designated leaf nodes, all other communication nodes being designated branch nodes, the acyclic directed graph having established parent-child relationships between all logically adjacent coupled communication nodes proceeding from the root node down to any leaf node; and

wherein said token master node generates a token which is passed between the communication nodes having the capability of operating in the token passing bus arbitration mode such that the communication node in possession of the token operates as a local root node for an associated one of said local clusters of nodes, the local root node receiving bus access requests from nodes within said associated local cluster of nodes and generating bus grant signals in response thereto.

Summary of the Invention:

...point-to-point link retransmits the received packet via other point-to-point links. A **tree** network configuration and associated packet handling protocol insures that each node receives every packet once...

...The P1394 Serial **Bus** Standard provides for an arbitrary **bus topology** wherein the **hierarchical** relationship between nodes of the serial bus is determined by the manner in which the...

...connected to one another. A P1394 serial bus is configured in three phases: bus initialization, **tree** identification, and node self identification...

...bus initialization, the general topology information of the serial bus is identified according to a **tree** metaphor. For example, each node is identified as being either a "branch" having more than one directly connected neighbor nodes or a "leaf" having only one neighbor node. During **tree** identification, hierarchical relationships are established between the nodes. For example, one node is designated a...

4/5,K/1 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
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03978560 E.I. No: EIP94112409083
Title: Simulation of binary tree and pyramid architectures on optical reconfigurable array processors
Author: Hossain, M.; Ghanta, S.
Corporate Source: King Fahd Univ of Petroleum and Minerals, Dhahran, Saudi Arabia
Source: Optics and Laser Technology v 26 n 4 Aug 1994. p 289-296
Publication Year: 1994
CODEN: OLTCAS ISSN: 0030-3992
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical)
Journal Announcement: 9412W4
Abstract: Computations on binary tree and pyramid topologies are powerful and are widely used parallel algorithm design techniques. Reconfigurable characteristics of optics provide an efficient way of solving problems in parallel. In this paper, we first design an optical vector processor that exploits the reconfigurable characteristics. A number of these processors connected in one-dimensional or two-dimensional arrays give ORBS (optical reconfigurable bus system) or ORMS (optical reconfigurable mesh system). We simulate the computations based on both binary tree and pyramid topologies on ORBS and ORMS respectively. (Author abstract)
Descriptors: *Optical data processing; Computer simulation; Software engineering; Algorithms; Optics; Data structures; Computational methods; Arrays; Design; Computational complexity
Identifiers: Parallel optical architectures; Optical reconfigurable **bus** system; Parallel algorithms; Binary **tree topology** ; **Pyramid** topology; Optical reconfigurable arrays; Optical reconfigurable mesh system; Processors
Classification Codes:
723.2 (Data Processing); 723.5 (Computer Applications); 723.1 (Computer Programming); 741.1 (Light/Optics); 721.1 (Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory)
723 (Computer Software); 741 (Optics & Optical Devices); 721 (Computer Circuits & Logic Elements)
72 (COMPUTERS & DATA PROCESSING); 74 (OPTICAL TECHNOLOGY)

Identifiers: Parallel optical architectures; Optical reconfigurable **bus** system; Parallel algorithms; Binary **tree topology** ; **Pyramid** topology; Optical reconfigurable arrays; Optical reconfigurable mesh system; Processors